

Use substitution to solve the system of equations:

1a.

$$y = -3x$$
$$-x + 6y = 38$$

$$-x + 6(-3x) = 38$$

$$-x - 18x = 38$$

$$-19x = 38$$

$$\frac{-19x}{-19} = \frac{38}{-19}$$

$$y = -3x$$
$$y = -3(-2)$$
$$y = 6$$

$$x = -2$$

 **$(-2, 6)$  Intersection Point**

1b.

$$x + 2y = 4$$
$$y = x - 7$$

$$x + 2(x - 7) = 4$$

$$x + 2x - 14 = 4$$

$$3x - 14 = 4$$

$$3x - 14 = 4$$
$$\underline{+14 \quad +14}$$
$$3x = 18$$

$$\frac{3x}{3} = \frac{18}{3}$$

$$y = x - 7$$
$$y = 6 - 7$$
$$y = -1$$

$$x = 6$$

 **$(6, -1)$  Intersection Point**

## Show & Explain?

2. Graph the system of equations:  $\begin{cases} \text{Equation 1} & y = -3x + 5 \\ \text{Equation 2} & -2x + y = -10 \end{cases}$

### Slope Intercept Form

$$y = -3x + 5 \quad m = -3 = \frac{-3}{1} \frac{\text{Rise}}{\text{Run}}, \quad b = 5 \quad \text{which means } (0, 5)$$

$$-2x + y = -10$$

### Standard Form

**x-intercept**

$(x, 0)$

$$-2x + y = -10$$

$$-2x + 0 = -10$$

$$-2x = -10$$

$$\frac{-2x}{-2} = \frac{-10}{-2}$$

$x = 5$  **therefore**

$(5, 0)$

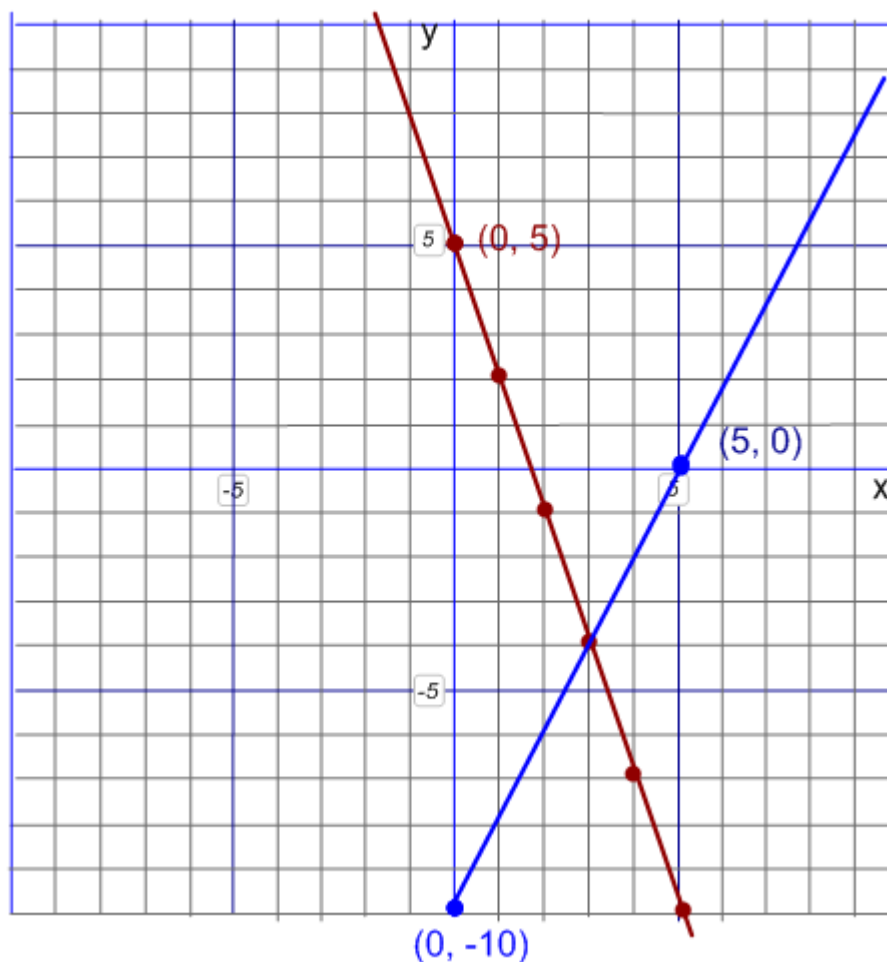
**y-intercept**

$(0, y)$

$$-2x + y = -10$$

$$-2 \cdot (0) + y = -10$$

$$y = -10 \quad \textbf{therefore} \quad (0, -10)$$

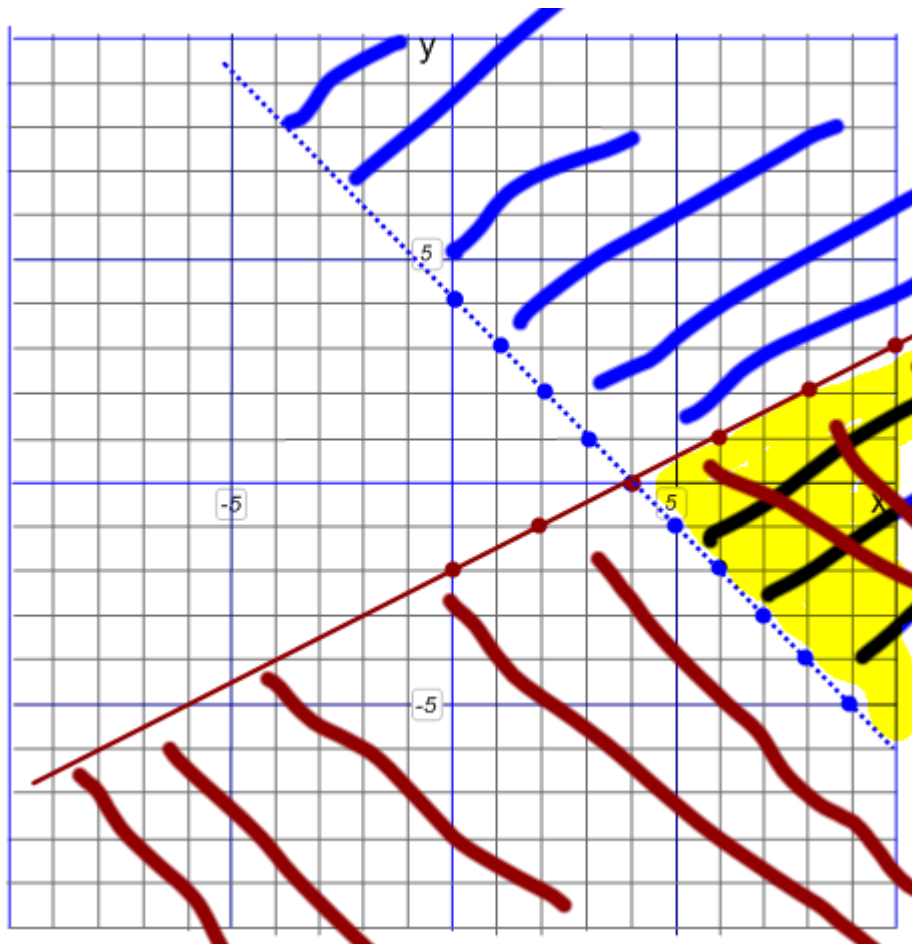


Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

3. Graph the system of Inequalities (Circle the correct Line and Shade):

$y > -x + 4$  Line: DOTTED or SOLID Shade: UP or DOWN

$y \leq \frac{1}{2}x - 2$  Line: DOTTED or SOLID Shade: UP or DOWN



Use the Elimination Method to solve the system of equations:

$$4. \quad \begin{aligned} x + 3y &= 7 \\ 2x - 3y &= -4 \end{aligned}$$

$$\begin{array}{r} x + 3y = 7 \\ + (2x - 3y = -4) \\ \hline 3x = 3 \end{array}$$

$$\frac{3x}{3} = \frac{3}{3}$$

$$\begin{array}{rcl} x = 1 & \begin{array}{l} x + 3y = 7 \\ 1 + 3y = 7 \end{array} & \begin{array}{r} 1 + 3y = 7 \\ -1 \quad -1 \\ \hline 3y = 6 \end{array} \end{array}$$

$$\begin{array}{r} 3y = 6 \\ \hline 3 \quad 3 \\ y = 2 \end{array}$$

**(1, 2) Intersection Point**

$$5. \quad \begin{aligned} -3x + y &= 1 \\ x + y &= 5 \end{aligned}$$

$$\begin{array}{r} -3x + y = 1 \\ -(x + y = 5) \\ \hline -4x = -4 \end{array}$$

$$\frac{-4x}{-4} = \frac{-4}{-4}$$

$$x = 1$$

$$\begin{aligned} x + y &= 5 \\ 1 + y &= 5 \end{aligned}$$

$$\begin{array}{r} 1 + y = 5 \\ -1 \quad -1 \\ \hline y = 4 \end{array}$$

**(1, 4)  
Intersection Point**